

LESSON  
**4.2**

Name Key Date \_\_\_\_\_

# Study Guide

For use with pages 159-162

**GOAL** Use the distributive property to evaluate expressions.

## VOCABULARY

**Distributive Property** You can multiply a number and a sum by multiplying the number by each part of the sum and then adding these products. The same property applies with subtraction.

**Numbers**  $5(2 + 3) = 5(2) + 5(3)$      $4(6 - 2) = 4(6) - 4(2)$

## EXAMPLE 1 Evaluating Expressions

a. Evaluate the expression  $12(3 + 4)$  by adding  $3 + 4$  first, then multiplying by 12.

$$\begin{aligned} 12(3 + 4) &= 12(7) \\ &= 84 \end{aligned}$$

b. Evaluate the expression  $12(3 + 4)$  by multiplying 12 times 3 and 12 times 4, then adding the products.

$$\begin{aligned} 12(3 + 4) &= 12(3) + 12(4) \\ &= 36 + 48 \\ &= 84 \end{aligned}$$

### Exercises for Example 1

Evaluate the expression by adding first, then multiplying. Also evaluate the expression by multiplying first, then adding the products.

1.  $3(5 + 6) = 3(11) = 33$

2.  $2(11 + 8)$

3.  $8(20 + 3)$

4.  $5(16 + 2)$

5.  $4(2.5 + 4.5)$

6.  $6(1.5 + 2.5)$

## EXAMPLE 2 Using the Distributive Property

a.  $7(12 + 4) = 7(12) + 7(4)$   
 $= 84 + 28$   
 $= 112$

b.  $9(10 - 3) = 9(10) - 9(3)$   
 $= 90 - 27$   
 $= 63$

c.  $8(4.2 + 6.1) = 8(4.2) + 8(6.1)$   
 $= 33.6 + 48.8$   
 $= 82.4$

d.  $3(7.7 - 5.8) = 3(7.7) - 3(5.8)$   
 $= 23.1 - 17.4$   
 $= 5.7$

### Exercises for Example 2

Use the distributive property to evaluate the expression.

7.  $4(7 + 10)$

8.  $2(13 + 18)$

9.  $5(16.2 + 7)$

10.  $10(2.3 + 5.4)$

11.  $6(15 - 3)$

12.  $7(50 - 22)$

13.  $12(10 - 5.5)$

14.  $8(9.4 - 4)$

Dist. Prop  
 $3(5) + 3(6)$   
 $15 + 18$   
 $33$

#10)  $10(2.3) + 10(5.4)$   
 $23 + 54$   
 $77$

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## EXAMPLE 3 Evaluating Products Using Mental Math

a. To find  $5(54)$ , rewrite 54.

$$\begin{aligned} 5(54) &= 5(50 + 4) \\ &= 5(50) + 5(4) \\ &= 250 + 20 \\ &= 270 \end{aligned}$$

b. To find  $7(8.9)$ , rewrite 8.9.

$$\begin{aligned} 7(8.9) &= 7(9 - 0.1) \\ &= 7(9) - 7(0.1) \\ &= 63 - 0.7 \\ &= 62.3 \end{aligned}$$

### Exercises for Example 3

Use the distributive property and mental math to find the product.

15.  $8(62)$

16.  $5(47)$

17.  $6(88)$

18.  $7(73)$

19.  $4(6.7)$

20.  $6(8.2)$

21.  $9(3.3)$

22.  $8(8.7)$

Subtract  
 $22) 8(9 - 0.3)$   
 $8(9) - 8(0.3)$   
 $72 - 2.4$   
 $69.6$

## EXAMPLE 4 Using a Formula

A Boeing 777 aircraft travels at a rate of 889 kilometers per hour.  
How far does the aircraft travel in 2 hours?

### Solution

Use the formula Distance = Rate  $\times$  Time.

$$\begin{aligned} \text{Distance} &= (889)2 \\ &= (900 - 11)2 \\ &= 900(2) - 11(2) \\ &= 1800 - 22 \\ &= 1778 \end{aligned}$$

Use 889 for the rate and 2 for the time.  
Rewrite 889 as  $900 - 11$ .  
Use the distributive property.  
Multiply.  
Subtract.

Answer: The aircraft travels 1778 kilometers in 2 hours.

### Exercise for Example 4

23. A Boeing 777 aircraft travels at a rate of 553 miles per hour.  
How far does the aircraft travel in 3 hours?

$$\begin{aligned} D &= R \cdot T \\ D &= 553 \cdot 3 \\ D &= 1659 \text{ miles} \end{aligned}$$